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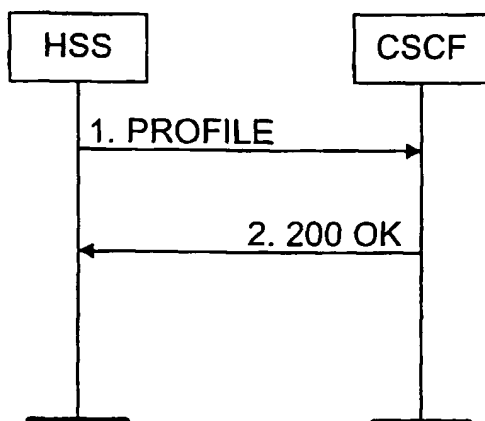
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(54) Title: EXTENDING SIP FOR UPLOADING SUBSCRIBER'S SERVICE PROFILE FROM HSS TO CSCF



(57) Abstract: The invention proposes a method for transmitting subscriber information from a first network element to a second network element, comprising the steps of inserting subscriber information in a specific message (1) of the same call control protocol that is used to establish the call; and sending the message from the first network element to the second network element. By this method, subscriber information can be easily uploaded from the first network element (e.g., a HSS) to the second network element (e.g., a CSCF). The invention also proposes a corresponding network system.



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**"EXTENDING SIP FOR UPLOADING SUBSCRIBER'S SERVICE PROFILE
FROM HSS TO CSCF"**

5

Field of the invention

The present invention relates to a method a network
10 system for transmitting subscriber information from a
first network element to a second network element.

BACKGROUND OF THE INVENTION

15

The present invention concerns the so-called subscriber
profile. The subscriber profile holds subscription
information about services and other parameters that have
been assigned to a subscriber for an agreed contractual
20 period. It includes information regarding subscribed
services, subscribed QoS (Quality of Service) profile
(i.e., service precedence(priority), reliability, delay,
throughput) etc. The data included in the subscriber
profile are needed by the network element executing the
25 service in order to handle the calls.

The subscriber profile includes for a given user, e.g.,
user identities, subscribed services and profiles,
service specific information, mobility management
30 information, authorization information etc.

In the 3GPP (Third Generation Partnership Project)
Release 2000 (in the following referred to as R00), this
data are hold in the HSS (Home Subscriber Server). Thus,
35 the HSS is the master database for a given user. It is

- 2 -

responsible for keeping a master list of features and services (either directly or via servers) associated with a user, and for tracking of location of and means of access for its users, i.e., provides the subscriber
5 profile.

During normal calls, this subscriber profile is required by other network elements which handle the calls. Hence, the subscriber profile has to be conveyed to these other
10 network elements.

Such a network element is a so-called Call State Control Function, for example. The CSCF is the call control entity in the all-IP architecture responsible for
15 supervising the call (or IP multimedia call). It handles the call establishment, supervision and disconnection signalling and may control resources associated with the call such as media gateways processing the various call related media streams.

20

A CSCF can fulfill different roles in an IP multimedia call signaling path, for example as a Serving CSCF (S-CSCF), an Interrogating CSCF (I-CSCF) or an Originating CSCF (O-CSCF), depending on which function it fulfills
25 during a call.

The Serving CSCF supports the signalling interactions with the UE (User Equipment), in particular, it provides a Serving Profile Database (SPD) described below. The
30 Home Subscriber Server (HSS) is updated with the Serving CSCF address and the HSS sends the subscriber data to the Serving CSCF for storage.

The Interrogating CSCF (I-CSCF) is used for mobile
35 terminated communications and is used to determine how to

- 3 -

route mobile terminated calls. The Interrogating CSCF interrogates the HSS for information to enable the call to be directed to the Serving CSCF.

5 Moreover, an Originating CSCF (O-CSCF) is the CSCF where the originating party is registered and where the originating party services are handled. On the other hand, the S-CSCF is the CSCF where the terminating party is registered and where the terminating party services
10 are handled.

For mobile terminated communications both Serving CSCF and Interrogating CSCF functionality can be involved. For mobile originated communications Interrogating CSCF
15 functionality is not required.

For controlling a call between the different CSCFs and the UE connected thereto, a call control protocol is required. One of such call control protocols is the so-called Session Initiation Protocol. In the following,
20 some aspects of SIP are described in short.

SIP is a general-purpose tool for the initiation, modification, and termination of sessions. That is, SIP
25 is an application-layer control (signalling) protocol that can establish, modify and terminate multimedia sessions or calls with one or more participants. These sessions include Internet multimedia conferences, Internet telephone calls, multimedia distribution and
30 similar applications. Members in a session can communicate via multicast or via a mesh of unicast relations, or a combination of these. As a core part of its functionality, SIP carries the ports, IP addresses and domain names needed to describe the sessions it
35 controls.

- 4 -

SIP can be used to initiate sessions as well as to invite members to sessions that have been advertised and established by other means.

5

In the following, items concerning SIP are described which are necessary for understanding the present invention.

10 In SIP, a plurality of different requests are exchanged. A request is composed by a request line followed by a header and, optionally, a message body.

In the following, an example a for request is listed:

15

INVITE sip: UE(B)@HSS.ipt.operator.com SIP/2.0

Via: I-CSCF.ipt.operator.com

From: UE(A)

To: UE(B)@ipt.operator.com

20 Content-type: application/sdp

Content-length: ...

<SDP information in the message body>

25 The request line is made up as follows:

Request-Line = Method Request-URI SIP-Version

A method is a predefined procedure. Currently, in SIP the
30 methods INVITE, ACK, OPTIONS, BYE, CANCEL and REGISTER
are defined. For simplifying the description, only the
methods INVITE and ACK are described in the following as
examples in short.

- 5 -

The INVITE method indicates that a user is being invited to participate in a sessions. Thus, the message body of a corresponding INVITE request contains a description of the session to which the callee is being invited.

5

The ACK method is used in the ACK request to confirm that a client has received a final response to an INVITE request. ACK is used only with INVITE requests. The ACK request may contain a message body with the final session
10 description to be used by the callee. If the ACK message body is empty, the callee uses the session description in the INVITE request.

The request-URI is a SIP URL (Uniform Resource Locator)
15 or a general URI (Uniform Resource Identifier). It indicates the user or service to which this request is being addressed.

Furthermore, the request-line comprises the SIP version
20 (e.g., SIP/2.0) in order to indicate the recipient which SIP version is used.

The header of the SIP request comprises a plurality of fields. In the following, only those fields are described
25 in short which are important for the present embodiment.

A field "Via" indicates the path taken by the request so far. This prevents request looping and ensures replies take the same path as the requests, which assists in
30 firewall traversal and other unusual routing situations. That is, each time a request is proxied, a new Via-field is added.

- 6 -

A field "From" indicates the initiator of the request, whereas the field "To" indicates the recipient of the request.

- 5 A field "Content-Length" indicates the size of the message body, in decimal number of octets, sent to the recipient.

A field "Content-Type" indicates the media type of the
10 message body sent to the recipient.

A field "Call-ID" uniquely identifies a particular invitation or all registrations of a particular client.

- 15 A field "CSeq" indicates a command sequence. It contains the request method (e.g., INVITE) and a single decimal sequence number chosen by the requesting client.

The message body comprises, for example, a description of
20 the multimedia connection to which a recipient is invited. For example, the so-called Session Description Protocol (SDP) is used for this purpose.

On receiving a request, the recipient can send a
25 response. For example, in case of an INVITE request, the recipient can agree to participating in the call by sending a so-called 200 OK response. A response is basically similar to a request, although the request-line is replaced by a status-line which in particular
30 comprises a status code, which is in the above example 200. This value indicates OK. The header of a response can contain similar fields as the request. For example, in case of an 200 OK response to an INVITE request, the CSeq field contains the same value, e.g., INVITE 1.

35

- 7 -

In Fig. 1, a basic example for network including the above-described network elements is shown. In detail, two User Equipments (UE) UE1 and UE2, and a plurality of CSCFs are shown. O-CSCF and I-CSCF comprise a Subscriber Profile Database (SPD) and each CSCF comprises a SIP message processor for handling the SIP requests and responses. As mentioned above, whether a certain CSCF is an O-CSCF, an I-CSCF or an S-CSCF depends on the function the CSCF has to fulfill.

10

In this example, UE1 originates a call to UE2. Thus, the CSCF to which it is connected, is an O-CSCF. The O-CSCF forwards a call request to an I-CSCF which, in turn, tries to obtain the address of UE2's S-CSCF by referring to an HSS. The I-CSCF obtains the address of the corresponding S-CSCF of UE2 and forwards the call thereto.

It is noted that in Fig. 1 the SPD in the O-CSCF and the S-CSCF has to interact with the HSS in the home domain to receive profile information for the R00 all-IP network user and store them. Furthermore, it notifies the home domain of initial user's access. In addition, it may cache access related information (e.g. terminal IP address(es) where the user may be reached etc.).

In this example, only the I-CSCF has to access the HSS for obtaining information regarding the location etc. of UE2. Thus, the CSCF has to obtain a subscriber profile from a HSS in order to handle the call according to UE2's services.

In R00, there is defined an interface Cx between the HSS and the CSCF. However, it is not defined yet how a

- 8 -

subscriber profile can easily be uploaded from the HSS to an CSCF via this interface.

5 SUMMARY OF THE INVENTION

Therefore, the object underlying the invention resides in removing the above drawbacks of the prior art.

- 10 This object is solved by a method for transmitting subscriber information from a first network element to a second network element, comprising the steps of
- inserting subscriber information in a specific message of the same call control protocol that is used to
- 15 establish the call; and
- sending the specific message from the first network element to the second network element.

- In addition, the invention proposes a network system
- 20 comprising a first network element and a second network element, wherein
- the first network element is adapted to insert subscriber information in a specific message of the same call control protocol that is used to establish the call,
- 25 and to send the specific message to the second network element.

- Thus, according to the invention the subscriber information are inserted in a specific message of the
- 30 same call control protocol that is used to establish the call.

- Therefore, according to the invention, an easy way of subscriber information uploading from one network element
- 35 to another is provided.

- 9 -

An advantage of the invention is that there is no need for an additional protocol for profile uploading purposes. That is, the same call control protocol used
5 for other call control purposes in the network can be used. Thus, the system can be kept less complex.

In case the subscriber information have been received successfully by the second network element, a
10 confirmation message may be sent from the second network element to the first network element. Thus, a successful uploading can easily be indicated to the first network element.

15 The call control message can be a PROFILE request based on the Session Initiation Protocol (SIP), the subscriber information being inserted in the message body of the request. That is, according to the invention, a new SIP method for profile uploading purposes is introduced.

20 Since SIP is already chosen as the call control protocol in R00, for example, no complex additional protocol is required, only an extended SIP (i.e., SIP including the new PROFILE request) is necessary.

25 The confirmation message is a SIP 200 OK message. In addition, the other SIP responses can be used to indicate failure situations.

The subscriber information can be a subscriber profile.
30

The first network element can be a Home Subscriber Server (HSS) and the second network element can be a Call State Control Function (CSCF). Thus, the invention provides a protocol for conveying subscriber information via the Cx
35 interface.

- 10 -

The Call State Control Function (CSCF) may be a Serving Call State Control Function (S-CSCF) or an Interrogating Call State Control Function (I-CSCF).

5

Alternatively, the first network element can be a Serving Call State Control Function (S-CSCF) and the second network element can be an Interrogating Call State Control Function (I-CSCF). Thus, also uploading between
10 two CSCFs is possible. This is advantageous during a dynamic CSCF selection, for example.

BRIEF DESCRIPTION OF THE DRAWINGS

15

The present invention will be more readily understood with reference to the accompanying drawings in which:

20

Fig. 1 shows a network including UEs, CSCFs and HSS,

Fig. 2 shows a procedure for profile uploading according to an embodiment of the invention,

25

Fig. 3 shows a procedure for registration on network level according to the embodiment, and

Fig. 4 shows a procedure for call delivery according to the embodiment.

30

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

In the following, a preferred embodiment of the invention is described in more detail with reference to the
35 accompanying drawings.

- 11 -

In particular, according to the embodiment described below, uploading of a subscriber profile from a first network element, e.g., a Home Subscriber Server (HSS), to
5 a second network element, e.g., a Call State Control Function (CSCF) is performed by using a specific call control protocol. This call control protocol is preferably also used in the network for other purposes.

10 In this embodiment, the Session Initiation Protocol (SIP) is used as the call control protocol.

According to the present embodiment, SIP is extended for uploading subscribers' service profile from HSS to CSCF.

15

That is, according to the embodiment a new SIP method for profile downloading is introduced, which is referred to as the SIP PROFILE method in the following

20 It should always be the HSS who initiates the PROFILE request, this request should contain the subscriber profile data. The CSCF should respond to the request in successful case with a 200 OK.

25 There are several alternatives for subscriber profile data representation conveyed in the PROFILE request, e.g. XML (eXtendend Markup Language), HTML (Hyper Text Markup Language). In the present embodiment, HTML is used for profile data representation.

30

Fig. 2 shows the profile uploading using the newly introduced PROFILE method. In step 1, the PROFILE request is sent to the CSCF, and the CSCF answers with a 200 OK response in case the subscriber profile was successfully
35 received.

- 12 -

In the following, a PROFILE request including the new PROFILE method is listed:

```
5      PROFILE sip:CSCF.ipt.operator.com SIP/2.0
      Via: HSS.ipt.operator.com
      From: UE@HSS.ipt.operator.com
      To: UE@ipt.operator.com
      Call-ID: 123456@HSS.ipt.operator.com
10     Cseq: 1 PROFILE
      Content-type: text/html
      Content-length:...

      <Subscriber profile represented with HTML>
15
```

That is, by the new PROFILE method, the subscriber profile is inserted in the message body. Hence, only this one message 1 (i.e., the PROFILE request) is necessary to

20 transmit the subscriber profile to the CSCF.

In case the message 1 was received successfully, the CSCF answers with a 200 OK response as follows:

```
25  2.  SIP/2.0 200 OK
      Via: HSS.ipt.operator.com
      From: UE@HSS.ipt.operator.com
      To: UE@ipt.operator.com
      Call-ID: 123456@HSS.ipt.operator.com
30     Cseq: 1 PROFILE
      Content-length:0
```

- 13 -

Thus, if the HSS receives a 200 OK response, it knows immediately that the subscriber profile was successfully transmitted.

- 5 The profile uploading as mentioned above is basically needed in two major scenarios: registration and mobile terminated call delivery.

Next, these two scenarios are described with reference to
10 Figs. 3 and 4.

Fig. 3 illustrates a registration procedure of a User Equipment UE.

- 15 In message A1, a SIP REGISTER request is sent from the UE to the S-CSCF. The REGISTER request is used in order to register an address listed in the To header field with a SIP server.
- 20 That is, the meaning of the header fields is defined slightly different from those of, e.g., the INVITE request. In detail, the To header field contains the address whose registration is to be created (or updated). The From header field contains the address of the person
25 (or entity) responsible for the registration. Since these addresses are not used in the way as they are in other request types (e.g., the INVITE request), they are referred to as "address-of-record". The Request-URI (included in the request-line) names the destination of
30 the registration request, i.e., the domain of the registrar.

In the procedure illustrated in Fig. 3, message A1 is a SIP REGISTER request. This message is received by the S-
35 CSCF.

- 14 -

A1. REGISTER sip:S-CSCF.ipt.operator.com SIP/2.0
Via: ab.cd.de::11.11 //UE's IP-address
From: UE@ipt.operator.com
5 To: UE@ipt.operator.com

In order to perform the requested registration of the UE,
the S-CSCF has to know the subscriber profile. Hence the
10 REGISTER request has to be forwarded to the HSS. The S-
CSCF finds the domain name of HSS based on the value of
the To header. S-CSCF proxies the REGISTER message
further towards the HSS in message A2.

15 A2. REGISTER sip:HSS.ipt.operator.com SIP/2.0
Via: S-CSCF.ipt.operator.com
Via: ab.cd.de::11.11
From: UE@ipt.operator.com
To: UE@ipt.operator.com

20

Thereafter, the HSS performs profile downloading with the
S-CSCF. This is effected as described above.

25 That is, the subscriber profile is immediately inserted
in a PROFILE request which is sent to the S-CSCF in A3.
This is performed as described above with respect to Fig.
2. That is, the PROFILE request is sent from the HSS to
the S-CSCF which responds with a 200 OK response.

30

On receiving the 200 OK message from the S-CSCF, the HSS
knows that the subscriber profile downloading was
successful and sends itself a 200 OK message A4 to the S-
CSCF.

35

- 15 -

A4. SIP/2.0 200 OK
Via: S-CSCF.ipt.operator.com
Via: ab.cd.de::11.11
From: UE@ipt.operator.com
5 To: UE@ipt.operator.com
Cseq: 1 REGISTER

This message is forwarded to the UE in message A5.

10

A5. SIP/2.0 200 OK
Via: ab.cd.de::11.11
From: UE@ipt.operator.com
To: UE@ipt.operator.com
15 CSeq: 1 REGISTER

After this message, the registration procedure has been successfully completed.

20

Next, as a further example where the profile downloading according to the present embodiment can be used, a call delivery is described below with respect to Fig. 4.

25 It is noted that here, REP (Remote Endpoint) represents the originating side of the call, e.g., a UE(A) and an O-CSCF together.

In a first message B1, an INVITE request is sent from the
30 REP to the interrogating CSCF, i.e., the I-CSCF.

- 16 -

- B1. INVITE sip:UE(B)@I-CSCF.ipt.operator.com SIP/2.0
Via: REP
From: UE(A)
To: UE(B)@ipt.operator.com
5 Content-type: application/sdp
Content-length:...
- <SDP information in the message body>
- 10
- In message B2, the I-CSCF proxies the INVITE message to the HSS.
- B2. INVITE sip:UE(B)@HSS.ipt.operator.com SIP/2.0
15 Via: I-CSCF.ipt.operator.com
Via: REP
From: UE(A)
To: UE(B)@ipt.operator.com
Content-type: application/sdp
20 Content-length:...
- <SDP information in the message body>
- 25 In this case, the HSS gives the answer that UE(B) has temporarily moved by responding with a 302 Moved Temporarily Response in message B3.

- 17 -

B3. SIP/2.0 302 Moved temporarily
Via: I-CSCF.ipt.operator.com
Via: REP
From: UE(A)
5 To: UE(B)@ipt.operator.com
Contact: UE(B)@S-CSCF.ipt.operator.com

This request comprises a header field "Contact" which
10 indicates a URL or URI where the user can be reached for
further communications.

Thereafter, the I-CSCF sends an acknowledgment ACK
request to the HSS in message B4.

15
B4. ACK sip:UE(B)@HSS.ipt.operator.com SIP/2.0
Via: I-CSCF.ipt.operator.com
From: UE(A)
To: UE(B)@ipt.operator.com

20

At this point the HSS may initiate a profile uploading
with the I-CSCF, if service control mechanism also
resides in the I-CSCF. This is performed as described
25 above with respect to Fig. 2. That is, the PROFILE
request is sent from the HSS to the I-CSCF which responds
with a 200 OK response.

Then, the I-CSCF proxies the INVITE message to the S-
30 CSCF in message B6.

- 18 -

B6. INVITE sip:UE(B)@S-CSCF.ipt.operator.com SIP/2.0
Via: I-CSCF.ipt.operator.com
Via: REP
From: UE(A)
5 To: UE(B)@ipt.operator.com
Content-type: application/sdp
Content-length:...

<SDP information in the message body>

10

Thereafter, a regular call setup is continued. Thus, a detailed description of the following messages is omitted.

15

In message B7, the INVITE request is transmitted to the UE(B), which acknowledges the INVITE request with a 200 OK response in message B8. This 200 OK message is forwarded to the REP (i.e., the UE(A)) in messages B9 and
20 B10. Finally, UE(A) acknowledges the OK of UE(B) by sending an ACK request to UE(B) in messages B11 to B13. Thereafter, the multimedia session can begin.

With respect to the profile downloading in this case
25 (i.e., message B5), it is noted that in this case in particular the location information included in the subscriber profile is important. For example, maybe user UE(B) is not entitled to use his mobile station in the location where he currently is. Since the subscriber
30 profile can basically divided in location (routing) information and service profile, it would also be sufficient in this case when only the location information (and/or service information which is location depending) is mandatorily downloaded to the I-CSCF.

35

- 19 -

As mentioned above, the representation of the subscriber profile in HTML is only an example, and, as a matter of course, other appropriate representations can be used.

5 The service profile part of the subscriber profile itself depends on the service execution architecture to be adopted in 3GPP for R00. Basically, there are three possibilities: CAMEL (Customized Applications for Mobile network Enhanced Logic), SIP and OSA (Open Service
10 Architecture).

The OSA (Open Service Architecture) defines an open API (Application Programming Interface) for the design, implementation, control and execution of services and
15 applications provided by third party service providers.

In case CAMEL is used for the service profile, then CSI (CAMEL Subscriber Information) using ASN.1 representation is utilized for representing the service profile.
20

In SIP, the service profile can be a script written in a script language, which may be, e.g., a common script language like Call Processing Language (CPL), Common Gateway Interface (CGI) or Java Enhanced SIP (JES).
25

In case of OSA, any of the above described service profiles can be used in an appropriate way.

The above description and accompanying drawings only
30 illustrate the present invention by way of example. Thus, the embodiment may vary within the scope of the attached claims.

- 20 -

Claims

1. A method for transmitting subscriber information
5 from a first network element to a second network element,
comprising the steps of
 inserting subscriber information in a specific
 message (1) of the same call control protocol that is
 used to establish the call; and
10 sending the message (1) from the first network
 element to the second network element.
2. The method according to claim 1, further comprising
the step of
15 sending a confirmation message (2) from the second
network element to the first network element in case the
subscriber information have been received successfully by
the second network element.
- 20 3. The method according to claim 1, wherein the call
control message is a PROFILE request based on the Session
Initiation Protocol (SIP), the subscriber information
being inserted in the message body of the request.
- 25 4. The method according to claim 2, wherein the call
control message is a PROFILE request based on the Session
Initiation Protocol (SIP), the subscriber information
being inserted in the message body of the request, and
the confirmation message (2) is a SIP 200 OK message.
30
5. The method according to claim 1, wherein the
subscriber information is a subscriber profile.
6. The method according to claim 1, wherein the first
35 network element is a Home Subscriber Server (HSS) and the

- 21 -

second network element is a Call State Control Function (CSCF).

7. The method according to claim 6, wherein the Call State Control Function (CSCF) is a Serving Call State Control Function (S-CSCF).

8. The method according to claim 6, wherein the Call State Control Function (CSCF) is an Interrogating Call State Control Function (I-CSCF).

9. The method according to claim 1, wherein the first network element is a Serving Call State Control Function (S-CSCF) and the second network element is an Interrogating Call State Control Function (I-CSCF).

10. A network system comprising a first network element and a second network element, wherein the first network element is adapted to insert subscriber information in a specific message (1) of the same call control protocol that is used to establish the call, and to send the message (1) to the second network element.

11. The network system according to claim 10, wherein the second element is adapted to send a confirmation message (2) to the first network element in case the subscriber information have been received successfully by the second network element.

12. The network system according to claim 10, wherein the call control message is a PROFILE request based on the Session Initiation Protocol (SIP), the subscriber information being inserted in the message body of the request.

- 22 -

13. The network system according to claim 11, wherein
the call control message is a PROFILE request based on
the Session Initiation Protocol (SIP), the subscriber
5 information being inserted in the message body of the
request, and the confirmation message (2) is a SIP 200 OK
message.

14. The network system according to claim 10, wherein
10 the subscriber information is a subscriber profile.

15. The network system according to claim 10, wherein
the first network element is a Home Subscriber Server
(HSS) and the second network element is a Call State
15 Control Function (CSCF).

16. The network system according to claim 15, wherein
the Call State Control Function (CSCF) is a Serving Call
State Control Function (S-CSCF).
20

17. The network system according to claim 15, wherein
the Call State Control Function (CSCF) is an
Interrogating Call State Control Function (I-CSCF).

25 18. The network system according to claim 10, wherein
the first network element is a Serving Call State Control
Function (S-CSCF) and the second network element is an
Interrogating Call State Control Function (I-CSCF).

30

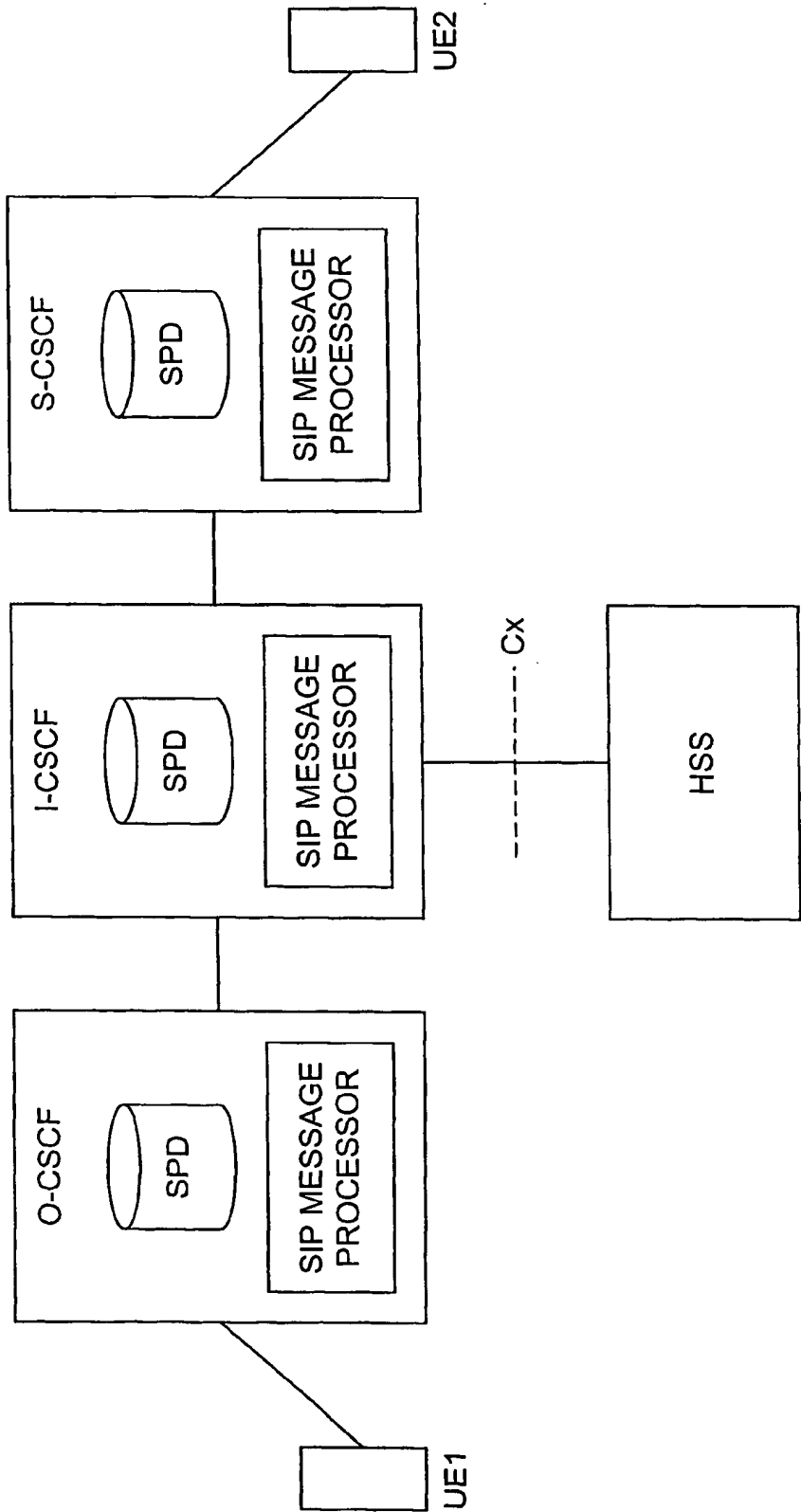


FIG. 1

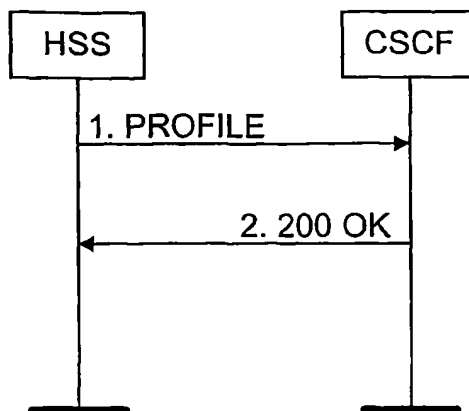


FIG. 2

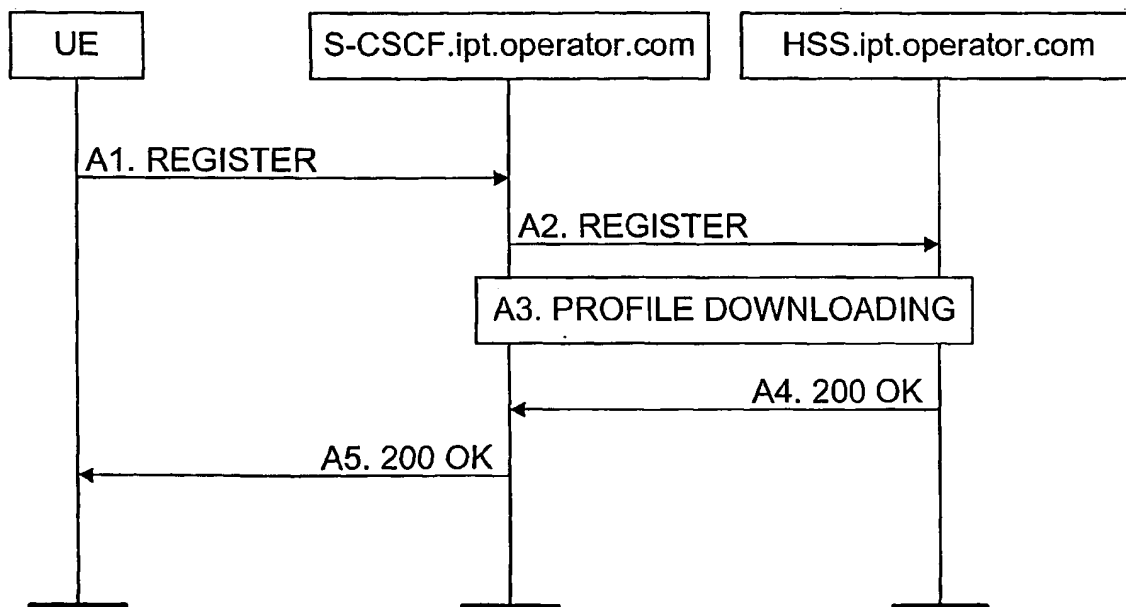


FIG. 3

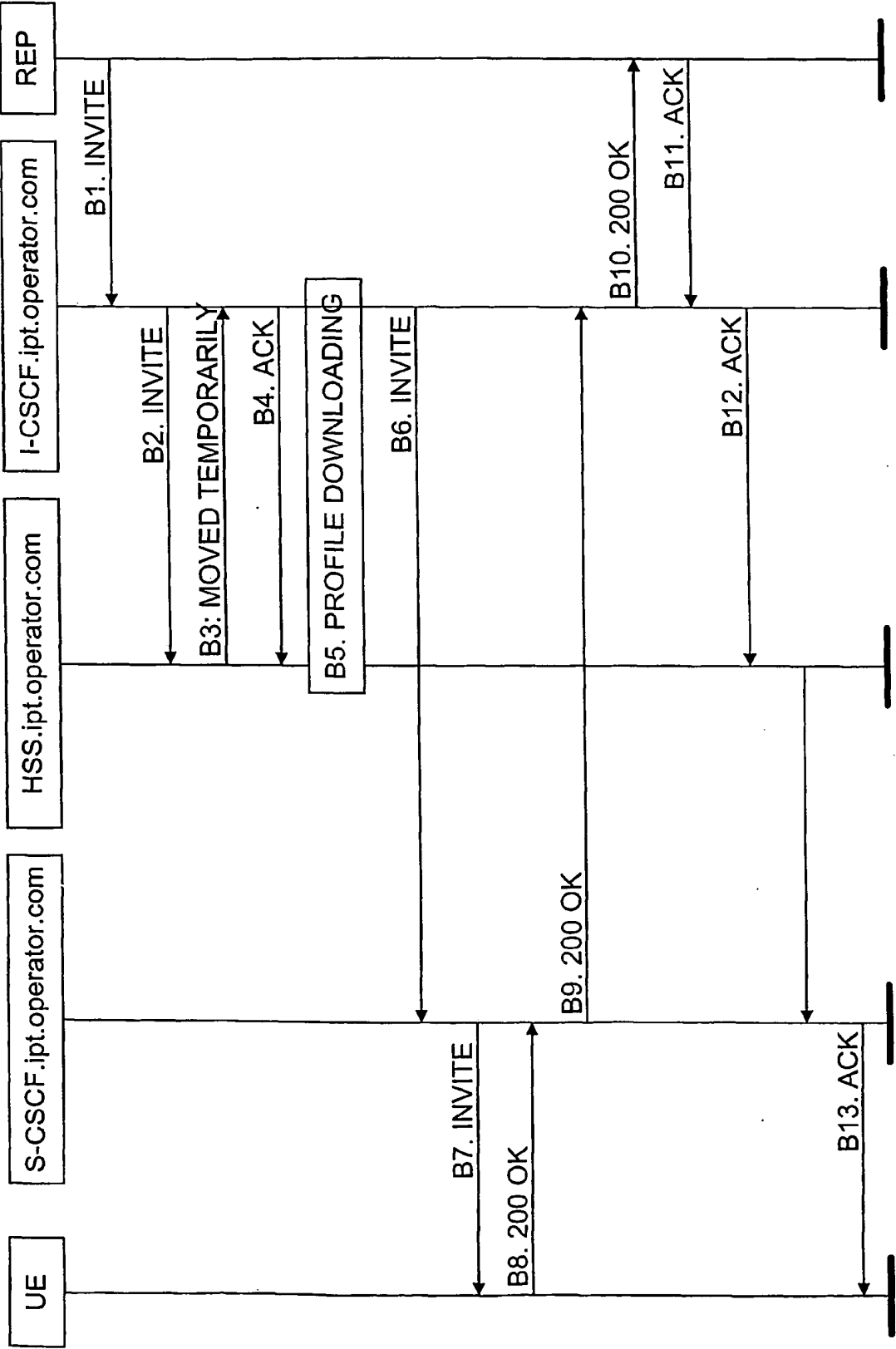


FIG. 4

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/EP 00/08590

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04Q7/24 H04L29/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04Q H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GIUSEPPE RICAGNI: "UMTS all-IP Mobility Management, Call and session control Procedures" INTERNET DRAFT - ANTONELLA NAPOLITANO CSELT, ITALTEL, 24 March 2000 (2000-03-24), pages 1-24, XP002149519 Page 5-8, Paragraph "Reference Model" Page 8-9, Paragraph "Attach Function" figures 1,3	1,10
A	WO 99 60801 A (ERICSSON TELEFON AB L M) 25 November 1999 (1999-11-25) page 4, line 16 -page 5, line 6 -/--	1,10

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

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- "&" document member of the same patent family

Date of the actual completion of the international search

25 June 2001

Date of mailing of the international search report

02/07/2001

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INTERNATIONAL SEARCH REPORT

International Application No.

PCT/EP 08590

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	<p>WO 00 79756 A (ERICSSON TELEFON AB L M) 28 December 2000 (2000-12-28) page 13, line 5 -page 14, line 9; figures 3B, 3C</p> <p>-----</p>	1-20

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Publication No

PCT/EP 00/08590

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9960801 A	25-11-1999	AU 4662999 A BR 9910633 A EP 1078537 A	06-12-1999 30-01-2001 28-02-2001
WO 0079756 A	28-12-2000	AU 5862400 A AU 5862500 A WO 0079741 A	09-01-2001 09-01-2001 28-12-2000